

## ENERGY EFFICIENCY SECTOR: COMMERCIAL

### ◆ HAWAII

#### Energy Codes for Buildings

Honolulu, Hawaii, and Kauai Counties in Hawaii have adopted building energy efficiency codes based on the Hawaii Model Energy Code, which was designed to help reduce energy use in all buildings. Saving energy is particularly important in Hawaii since the islands are highly dependent on imported oil with unstable prices and availability. The model code requires a minimum level of energy efficiency that is cost-effective for all building types. It is based primarily on ASHRAE Standard 90.1-1989, *Energy Efficient Design of New Buildings Except Low-Rise Residential Buildings*, and has also been influenced by some California codes, ASHRAE 90.2P, and the US DOE standard for non-residential buildings. Hawaii's Model Code has some original requirements as well, adapted to the unique aspects of the Hawaiian islands. In addition to the minimum requirements for energy efficiency, the code encourages designers and builders to seek additional ways to reduce energy use and increase conservation.



The scope of the Code adopted by Hawaii County includes nonresidential and residential buildings, except single family homes and duplexes. The Honolulu and Kauai County Codes only cover commercial buildings, which are defined to include residential buildings over three stories high. The Hawaii, Honolulu, and Kauai County Codes cover new development as well as some renovation. Maui recently introduced Energy Code legislation and County officials hope that it will be adopted in a few months.

#### Results:

Energy code compliance in 1998 for Honolulu, Hawaii, and Kauai Counties resulted in an estimated cost savings of \$1.06 million and energy savings of 10,600 MWh (36,160 mmBTU\*) (for approximately 1,602 dwellings). These energy savings decreased the amount of fossil fuels burned by electric utilities, and therefore resulted in GHG emission reductions of about 744 MTCE\*\*. Cost savings from the Code accumulate over time as new buildings begin to meet code requirements, and buildings built in earlier years continue to save energy. By the year 2013, annual statewide energy savings are projected to reach approximately 217 million kWh per year (equivalent to a greenhouse gas emission reduction of 15,900 MTCE/yr). These annual energy savings could supply 28,500 homes (at rate of 7,600 kWh/home/yr). The largest energy savings from the code are attributed to the lighting requirements.

Energy Savings	Cost Benefits	Greenhouse Gas Reductions
36,160 mmBTU*/yr	\$1,060,500/yr (customer energy savings)	744 MTCE**/yr

#### Principal Actors:

The Hawaii Energy Code was refined with input from the Building Code Task Force, consisting of engineers, architects, building officials, and representatives of professional groups and building owners and managers.

#### Additional Information:

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This case study is based on information provided by Harold Wiig, Hawaii Department of Business, Economic Development and Tourism. The picture was obtained from an NREL/PIX picture database.

\* Original data have been converted from MWh to mmBTU of energy savings and from projected energy savings to estimated actual savings based on the fact that "savings equal 13% of the predictions in the original impact analysis."

\*\* Original data have been converted from MWh/yr energy savings to Metric Tons of Carbon Equivalent (MTCE).